

Application No. 09/322,283

TRW Docket No. 12-0895

REMARKS

Upon entry of instant amendment, claims 1-5, 7 and 12-24 are pending. A Declaration by the sole inventor, David L. Rollins, is attached which swears behind the Burns (U.S. Patent No. 5,917,970); Dishman et al. (U.S. Patent No. 6,271,953) and Franck et al. (U.S. Patent No. 6,188,497) as well as the technical article entitled, "Linearization of a Broadband Analog Optical Link Using Multiple Wavelengths" by Edward Ackerman, Technical Digest International Topical Meetings on Microwave Photonics, October 12-14, 1998, pages 45-47. Based on the instant amendment and the remarks below, it is respectfully submitted that the application is in condition for allowance.

Drawing Objections

The drawings have been objected to under 37 CFR 1.83(a). Applicant respectfully disagrees with the drawing objection for several reasons. First, the bias control circuit is clearly shown in the drawing. For example, FIG. 3 clearly illustrates a circuit identified with the reference numeral 50 entitled "Bias Control." As set forth on page 9 of the specification, lines 4-6:

"The bias control circuit 50 in accordance with the present invention is a low frequency copy of the demodulator 56 and thus includes a WDM, (not shown) a pair of photodetectors and a summing junction (not shown)."

FIG. 4 illustrates the demodulator 56 with a wavelength division multiplexer 58, a pair of photodetectors 60, 62 and a summing junction 64. Accordingly, it is respectfully submitted that since the specification states that the bias control circuit 50 is a "copy" of the demodulator 56, it is respectfully submitted that this feature is shown.

With respect to the dithering means, claim 6 is canceled. Accordingly, the Examiner is respectfully requested to reconsider and withdraw the drawing objection.

Claim Rejection 35 USC 112

Claims 3, 4, 16 and 17 have been rejected under 35 USC 112, first paragraph, for allegedly containing subject matter not described in the specification to enable one skilled in the art to make and/or use the invention. This rejection relates to bias control circuit 50.

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Specifically the rejection is based on the fact that the "Specification does not clearly describe how the bias control circuit 50 controls the modulator by using a WDM, a pair of photodetectors and a summing junction." Applicant respectfully disagrees with the allegation in paragraph 3 of the Detailed Action. In particular, page 9 of the specification, lines 8 and 9 state that:

"The DC bias voltage is adjusted in order to null the differential photo current".

Therefore, it is clear that the DC voltage applied to the input of the WDM is adjusted until the photodetector outputs are identical, in which case they are summed to zero in the summer 64. Thus, Applicant respectfully requests the Examiner to reconsider and withdraw this rejection.

Claims 3, 4, 6 and 16-21 have been rejected under 35 U.S.C. 112, second paragraph, for being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. In response to this rejection, claims 3, 4, 16 and 17 have been amended to include the summing junction. In addition, claims 4 and 17 have been amended to recite that the bias control circuit is coupled to the input port of the Mach Zehnder modulator.

For all of the above reasons, the Examiner is respectfully requested to reconsider and withdraw this rejection.

Claim Rejections 35 USC 102

Claims 1, 2, 5, 10, 11, 13-15 and 22-24 have been rejected under 35 USC 102(e) as being anticipated by Burns et al. (U.S. Patent No. 5,917,970). As set forth in the attached declaration by David L. Rollins, Applicant hereby swears behind the Burns et al. patent. Accordingly, this objection is obviated.

Claims 1, 2, 5, 6, 8-11, 13-15 and 22-24 have been rejected under 35 USC 102(e) as being anticipated by Ackerman. As set forth in the attached Declaration under Rule 1.131, Applicant hereby swears behind the Ackerman article. Accordingly, this rejection is obviated.

Claims 8 and 9 have been rejected under 35 USC 102(e) as being anticipated by Fee (U.S. Patent No. 5,995,256). Claims 8 and 9 have been canceled. Accordingly, this rejection is obviated.

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Claims 10 and 11 have been objected under 35 USC 102(b) as being anticipated by Kintis et al. (U.S. Patent No. 5,661,582). Claims 10 and 11 have been canceled, thus this rejection is obviated.

Claims 10 and 12 have been rejected under 35 USC 102(e) as being anticipated by Dishman et al. (U.S. patent No. 6,271,953). As set forth in the attached Declaration, Applicant hereby swears behind the Dishman et al. patent. Moreover, claim 10 has been canceled. The Examiner is respectfully requested to reconsider and withdraw this rejection.

Claim Rejection 35 USC 103

Claim 7 has been rejected 35 USC 103(a) as being unpatentable over the Burns et al. patent in view of the Dishman et al. or Franck et al. patents. As set forth in the attached Declaration by David L. Rollins, Applicant respectfully swears behind the Burns et al., Dishman et al. and Franck et al. patents. Thus this rejection is obviated.

Claims 3, 4, 6 and 16-18 have been rejected under 35 USC 103(a) as being unpatentable over the Ackerman article in view of Yao (U.S. Patent No. 5,917,179). As set forth in the attached Declaration by David L. Rollins, Applicant hereby swears behind the Ackerman article. It is respectfully submitted that the Yao patent does not otherwise disclose or suggest the invention recited in claims 3, 4, 6 and 16-18. For all of the above reasons, the Examiner is respectfully requested to reconsider and withdraw this rejection.

Claims 19-21 have been rejected under 35 USC 103(a) as being unpatentable over the Ackerman article in view of the Dishman et al., Franck et al. and Yao patents. As set forth in the attached Declaration under 97 CFR 1.131, Applicant hereby swears behind the Ackerman article as well as the Dishman et al. and Franck et al. patents. In addition, as set forth above, the invention recited in claims 19-21 is not otherwise disclosed in the Yao patent. For all of the above reasons, the Examiner is respectfully requested to reconsider and withdraw this rejection.

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An earnest attempt has been made to address each and every one of the issues set forth in the Official action. An early allowance is solicited.

Respectfully submitted,

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ATTACHMENT FOR CLAIMS
VERSION WITH MARKINGS TO SHOW CHANGES MADE
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3. (Amended) The transmitter as recited in claim 1, wherein said bias control circuit includes a pair of photodetectors, a summing junction and a wavelength division multiplexer (WDM).

4. (Amended) The transmitter as recited in claim 3, wherein said WDM, said summing junction and said pair of photodetectors are coupled to said optical [output] input port of said Mach-Zehnder modulator.

12. (Amended) [The] An optical system [as recited in claim 10,] comprising:
an optical transmitter, said optical transmitter including an optical modulator for modulating an RF input signal onto an optical carrier signal having multiple wavelengths and defining an RF modulated optical signal;
an optical receiver for demodulating said RF modulated optical signal and providing an RF output signal; and
an optical link connecting said optical transmitter and said optical receiver, wherein said optical link is in free space.

13. (Amended) [The] An optical system [as recited in claim 10,] comprising:
an optical transmitter, said optical transmitter including an optical modulator for modulating an RF input signal onto an optical carrier signal having multiple wavelengths and defining an RF modulated optical signal;
an optical receiver for demodulating said RF modulated optical signal and providing an RF output signal; and
an optical link connecting said optical transmitter and said optical receiver, wherein said optical modulator is a Mach-Zehnder modulator having an RF input port, a bias voltage input port, an optical carrier input port, and an optical output port.

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16. (Amended) The optical system as recited in claim 15, wherein said bias control circuit includes a wavelength division multiplexer (WDM), a summing junction and a pair of photodetectors.

17. (Amended) The optical system as recited in claim 16, wherein said WDM, said summing junction and said pair of photodetectors are coupled to said [output] input port of said Mach-Zehnder modulator.